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The Paradox of Public Spending in Angola: An Analysis from a Keynesian Perspective

O Paradoxo do Gasto Público em Angola: Uma Análise à Luz da Perspectiva Keynesiana

La Paradoja del Gasto Público en Angola: Un Análisis desde una Perspectiva Keynesia-na

Paulo Vica[1]

ABSTRACT

This study analyses the determinants of economic growth in Angola, with a particular focus on the composition of public expenditure and its interaction with key macroeconomic variables. Methodo-logically, the research employs a Vector Autoregressive (VAR) model as the main empirical strategy, allowing the capture of dynamic interdependencies between Gross Domestic Product (GDP), different types of public spending, the exchange rate, the price of oil, and tax revenue. The variables were transformed into natural logarithms and tested for stationarity using the Augmented Dickey-Fuller test, and subsequently differenced to ensure adequate time series properties. The results reveal that the effects of public spending on economic growth vary significantly depending on its composition. In particular, public investment exhibits the most robust positive impact, while spending on wages and pensions shows moderate effects, and spending on goods and services demonstrates lower economic efficiency. Additionally, the price of oil emerges as a determining variable, reinforcing the external vulnerability of the Angolan economy. The results suggest that the sustainability of economic growth depends not only on the volume of public spending but above all on its composition, making it crucial to prioritise spending with a greater multiplier effect.

Keywords: GDP Growth; Diversification; Public Expenditure; Angola; VAR.

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Resumo

O presente estudo analisa os determinantes do crescimento económico em Angola, com particular enfoque na composição da despesa pública e na sua interação com variáveis macroeconómicas chave. Do ponto de vista metodológico, a investigação recorre a um modelo de Vetores Autorregressivos (VAR), como principal estratégia empírica, permitindo captar as interdependências dinâmicas entre o Produto Interno Bruto (PIB), os diferentes tipos de gasto público, a taxa de câmbio, o preço do petróleo e a receita fiscal. As variáveis foram transformadas em logaritmos naturais e testadas quanto à estacionariedade através do teste de Augmented Dickey-Fuller test, sendo posteriormente diferenciadas para garantir propriedades adequadas das séries temporais. Os resultados revelam que os efeitos da despesa pública sobre o crescimento económico variam significativamente em função da sua composição. Em particular, os investimentos públicos apresentam o impacto positivo mais robusto, enquanto os gastos com salários e pensões evidenciam efeitos moderados e os gastos com bens e serviços demonstram menor eficiência económica. Adicionalmente, o preço do petróleo emerge como variável determinante, reforçando a vulnerabilidade externa da economia angolana. Os resultados sugerem que a sustentabilidade do crescimento económico depende não apenas do volume da despesa pública, mas sobretudo da sua composição, sendo crucial priorizar gastos com maior efeito multiplicador.

Palavras-chave: Crescimento do PIB; Diversificação; Gastos Públicos; Angola; VAR .

Resumen

Este estudio analiza los determinantes del crecimiento económico en Angola, con especial énfasis en la composición del gasto público y su interacción con variables macroeconómicas clave. Meto-dológicamente, la investigación utiliza un modelo autorregresivo vectorial (VAR) como estrategia empírica principal, lo que permite capturar las interdependencias dinámicas entre el Producto Interno Bruto (PIB), los diferentes tipos de gasto público, el tipo de cambio, el precio del petróleo y los ingresos fiscales. Las variables se transformaron en logaritmos naturales y se comprobó su estacionariedad mediante la prueba de Dickey-Fuller aumentada, para luego diferenciarlas y asegurar propiedades de series temporales adecuadas. Los resultados revelan que los efectos del gasto público sobre el crecimiento económico varían significativamente según su composición. En particular, la inversión pública muestra el impacto positivo más robusto, mientras que el gasto en salarios y pensiones presenta efectos moderados, y el gasto en bienes y servicios demuestra una menor eficiencia económica. Además, el precio del petróleo emerge como una variable determi-nante, lo que refuerza la vulnerabilidad externa de la economía angoleña. Los resultados sugieren que la sostenibilidad del crecimiento económico depende no solo del volumen del gasto público, sino sobre todo de su composición, por lo que resulta crucial priorizar el gasto con un mayor efecto multiplicador

Palabras clave: Crecimiento del PIB; Diversificación; Gasto Público; Angola; VAR.

Introduction

The chronic problem of fiscal and external account imbalances has been a pattern in poor countries, resulting from structural characteristics common to these economies (Rodrik, 2016). Although these problems are not confined to African countries alone, they are particularly prominent due to a combination of historical, economic and political factors that characterise the African continent. Successive fiscal and/or external deficits arise from a standard characteristic of these economies, such as high concentration in natural resources, high informality, weak public financial management and currency depreciation. These stylised facts have for decades trapped these economies in a vicious circle. Empirical studies (Sachs & Warner, 1995) demonstrate that less diversified economies, based essentially on resource extraction, have experienced the illusion of sustainable economic growth. This illusion is perceived in the approval of the General State Budgets (GSB), resulting in the growing need for financing the economy, often above that permitted by law, which increases pressure on essential social spending. From this perspective, fiscal policy becomes ineffective due to external financing constraints.

Angola has faced, over the last ten years, successive cyclical crises and rapid slowdowns in GDP growth, after a period of double-digit economic growth (2002 to 2008). The country's productive structure is strongly concentrated in two segments of economic activity: crude oil extraction (70%) and diamonds (5%), both commodities. Dependence on volatile revenues has greatly compromised the sustainable growth of its economy, given the oscillating behaviour of the price of "black gold" on the international market, which makes it difficult to realistically forecast revenues and efficiently execute public spending. The need for financing arises from mismatches between revenues and public spending.

Angola has accumulated significant public debt, partly due to low economic diversification, weak institutions and excessive dependence on imports, especially of foodstuffs and basic equipment.

On the other hand, the Angolan tax system has proved incapable of reversing almost recurrent deficits. This incapacity stems from a double problem: (1) a narrow tax base, marked by high informality, and (2) high taxes applied to the formal sector. These factors negatively impact economic activity, discouraging investment, inhibiting job creation and undermining the competitiveness of firms.

The transition to an economy less dependent on commodity extraction is a necessary proposal to solve many of the fiscal and structural problems faced by Angola. A diversified economy, with higher added value, promotes the expansion of the tax base, fiscal stability, reduces informality and reduces pressure on social spending.

However, the path to Angola's economic transition necessarily involves a reformulation of public policies that allows structural change to be accelerated, thereby promoting industrialisation and manufacturing, agroindustry, innovation and technology, as well as regional integration. Prioritising an agenda focused on renewable energies represents a decisive strategic opportunity for Angola. We are moving towards an era in which the much-vaunted "black gold", once synonymous with wealth, will be worth less and less. The signs are already visible and irreversible, as demonstrated by the ongoing transformation in the global automotive industry. By betting on renewables, the country not only diversifies its productive matrix and reduces dependence on volatile commodities, but also creates conditions to attract external investment, stimulate the formalisation of new sectors and sustainably broaden the fiscal base.

Angola seems trapped in a classic chicken-and-egg dilemma: after all, which should come first, economic growth or the generation of public revenue? The answer, although seemingly obvious, proves complex in the Angolan context. The economy needs to grow to expand tax collection, but, at the same time, sufficient revenue is needed to finance efficient and transformative public spend-ing. It is at this point that the real challenge arises: breaking the cycle of stagnation and activating Myrdal's cumulative principle, according to which growth is only sustained when effective public policies reinforce, in a chain, productive and social dynamism.

The current discussion revolves around the sustainability of public spending, especially in a context where the Angolan economy faces severe fiscal constraints, amplified by high productive concentration. This scenario raises a critical question: which public expenditures should be prioritised? Should salary payments be favoured over subsidies? Or the hiring of legal and economic advisory services instead of the rehabilitation of infrastructure such as roads?

Regardless of preferences, it is assumed that these are necessary expenditures. And, if we consider Keynes's multiplier principle, public spending tends to play a relevant role in stimulating economic activity. However, the central question remains: do all types of public spending contribute positively and significantly to the growth of Angolan GDP?

This doubt opens the way for a more indepth analysis of the allocative efficiency of public resources, and of the urgency of qualifying state expenditure, going beyond volume to consider its real multiplier effects on the economy.

Thus, the objective of this study is to propose allocation priorities for public spending that the Angolan Executive can adopt, given the current context of fiscal constraint.

Structural change in Angola: Bases for revenue mobilisation

Angola remains trapped in the trap of the illusion of economic growth concentrated on commodity exports. Concentration on products with low productive integration, characteristic of African economies, makes its growth unbalanced and unstable, due to the high dependence on external factors over which domestic economic policy has almost no control. This situation, combined with weak institutions, has contributed significantly to the slow pace of development of this economy over time.

However, Angola is facing a window of opportunity in terms of expanding its economic activities, in relation to the degree of market penetration and commercial openness of the world market, according to the economic complexity approach. On the one hand, this theoretical approach makes it possible to identify the best strategy for external insertion so that the country can accelerate its economic growth. On the other hand, political stability, the consolidation of the democratic process and government transparency must receive greater attention, as they affect the country's ability to attract more quality external investment that can identify non-ubiquitous products, increase productive diversification, develop strategic emerging sectors and thereby increase tax revenues.

Historically, Angola and other African countries have seen international trade as the most realistic opportunity to relaunch the foundations of development, through expanding their exports. In this way, states believe that trade can improve macroeconomic performance and social indicators, due to access to new markets, productive diversification, the expansion of income sources, access to new knowledge and technology transfer. Furthermore, trade stimulates the increase in domestic employment and contributes to rising income, as argued by certain theses [Smith (1776); Ricardo (1817); Young (1928); Myrdal (1960); Rosenstein-Rodan (1940); Verdoorn (1949); Balassa (1965); Kaldor (1966); and, more recently, Hausmann and Hidalgo (2009)]. However, the results observed since the end of the last century have still fallen short of the arguments that allowed the dissemina-tion of the "international trade" theses.

Structural change must be capable of providing an increase in the per capita income of economies in the long term, through diversification towards less available (non-ubiquitous) products, reversing the paradigm of growth driven by commodity exports. However, it is necessary for states to adopt innovative and sustainable public policies, investing heavily in local human capital and logistical infrastructure so that society can appropriate the gains from knowledge accumulation capable of driving the market through exports specialised in emerging sectors of the economy.

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Smith (1776) explores the causes of countries' economic growth, more related to the ability to supply goods with lower opportunity cost. For Smith, the 'division of labour' as such was decisive for manufacturing production to assume a central role in the growth process. Ricardo (1817) explained international trade through 'comparative advantage'. Thus, Smith and Ricardo helped disseminate external trade sustained by specialisation – productivity – of countries.

In turn, Young (1928), in his work "Increasing Returns and Economic Progress", brings the discus-sion of the role of industries in the process of growth of economies of scale and increasing returns. According to the author, industry is the economic sector that best allocates production factors, allowing returns to increase without altering the production price, due to its characteristic of having a relatively low opportunity cost. Thus, Young associates wide production and cost dilution with an intrinsic characteristic of industries, which plays a fundamental role in the growth of exports and, consequently, of the economy.

Myrdal (1960), when addressing inequalities between countries in the context of development, through trade, highlights that poor countries remained in their condition of poverty due to the lack of industries capable of breaking the "vicious circle".

According to Kaldor (1966), the manufacturing industry is unequivocally the best mechanism to explain rapid economic growth. The author demonstrated that the rapid decline in the growth rate of the United Kingdom (UK) economy was related to the slow expansion of manufacturing industries, that is, the economy lost competitiveness by exporting fewer and fewer manufactured products. Therefore, countries with higher industrial productivity tend to export more manufactured products, promoting a virtuous cycle in the economy. This thesis corroborates Verdoorn (1949), who states that there is a causal relationship between productivity and output growth. Countries that adopt policies to foster production have a similar effect on the productivity of that economic activity. This thesis is known as "Verdoorn's Law (1949)".

Diversification has been widely debated and emerged in a systematised way in economics by Hirschman (1958), in his work 'The Strategy of Economic Development'. He used the concept to explain the difficulties faced by underdeveloped countries during the consolidation of economic policies that would sustain their transition. For the author, the development process occurs without 'mismatches' between the main sectors of the economy. Public investment, as a determining variable in this process, is in sufficient quantity to supply the needs of the economy. For Hirschman (1958), developing countries must make structuring investments in the economy, so that the positive effects on the productive chain (productive integration) are fully exploited by the most diverse sectors.

Sachs and Warner (1995) highlight that countries rich in natural resources, notably, face a trade off between economic growth and diminishing incentives for their diversification. As these economies grow, through the exploitation of these resources, they make the manufacturing and service sectors less productive, given the absence of concrete actions on the part of the government that allow the economy to move towards the development of diversified value chains. Furthermore, countries rich in natural resources present greater public policy biases, which worsens the quality of institutions. Therefore, diversification in these economies requires structuring, transparent policies and the strengthening of investments in other sectors.

Rocha et al. (2018) emphasise that diversification results from the commitment of institutions guided by transparent political conduct and good governance, and whenever this behaviour gives way to another, diversification is hardly consolidated.

The proposal for structural change is configured as an alternative to excessive productive concentration and dependence on low-integration sectors. This productive configuration concentrated on the exploitation of natural resources, allied with the inefficiency of public spending, has made it difficult to sustain the economy without constantly resorting to financing.

So far, the central role of the government in the economy is explicit, especially in developing countries, as is the case of Angola, which is at an embryonic stage of the private sector. However, the government needs to assume the characteristics described above, so that its role does not become fruitless.

Stylised facts of the angolan economy

The Angolan economy has a commercial profile that does not allow it to grow sustainably, as it exports more commodities and acquires from abroad, for example, refined oil, wheat and vehicles. This type of import restricts the country's ability to make structuring investments, as well as limiting the action of fiscal policy.

The country's commercial profile has generated fiscal imbalances, on the one hand, due to external shocks given its productive structure, as well as the quality of spending it has carried out. Its productive structure, poorly diversified, has made it difficult to expand the tax base, thereby giving rise to new taxes and/or an increase in the tax rate. Furthermore, the main economic activities (% of GDP) contributing to tax revenue have generated fewer jobs.

The agricultural and service sectors employ about twelve million individuals, while 8% of the workforce is in industry (Graph 1). Regarding the weight of sectors in GDP (Graph 2), data [INE (2023)] indicate that the oil sector has been the one that best contributes to industry (35%). The participation of sectors in the economy (% of GDP) has observed slow changes over twenty years: industry (45.10% - 56.53%), services (38.22% - 39.80%) and agriculture (5.89% - 13.70%). And although a decline in the industrial sector's participation in the economy has been observed since 2009, it remains the "flagship" of the economy, albeit extractive industry.

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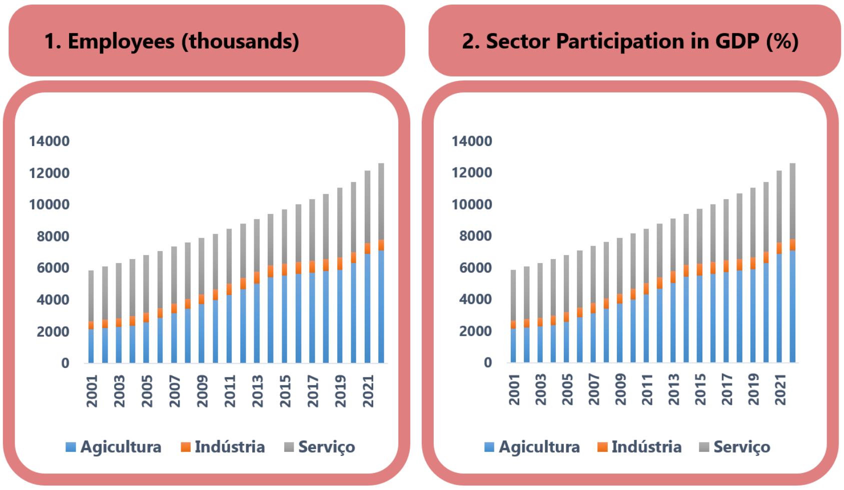


Source: Data extracted from the OIT (2022)

Source: Data extracted from the OIT (2022)

Graph 1 e 2. Activity Sectors: Jobs Created and Share of GDP

In the context of trade exchanges (1990–2022), the country had a degree of trade openness of 0.74. That is, 74% of national economic activity passes through external trade. Thus, in this section, we seek to analyse the Product Concentration Index (IPC) (Herfindahl-Hirschman) and Balassa's (1965) Revealed Comparative Advantage Index for Angola. The Herfindahl-Hirschman index (ICP) indicates whether the country has a more concentrated export basket. The index is calculated using the following expression (Love, 1979):

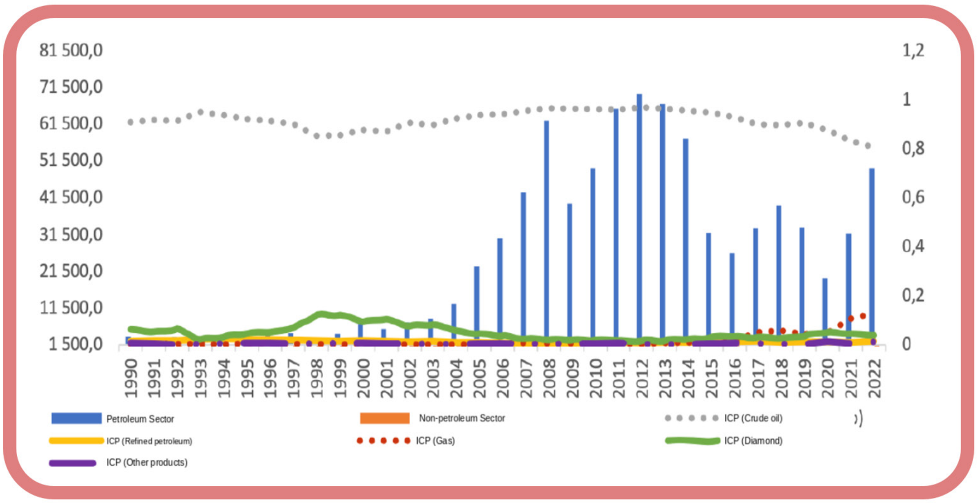
$$ICP = \sqrt{\sum \left[\frac{X_{ia}}{X_a}\right]^2}$$

Where:

X_{ia} is the volume of exports of good i from country (a);
X_a is the total volume of exports carried out by country (a).

According to Vica (2025), oil has an average index of 0.91 over the last thirty-two years, confirming excessive productive concentration and high dependence on this sector. Given the concentration, we verify whether the country is at least competitive in this sector, using the competitive advantage index (VCR) – Table 1.

The table immediately below demonstrates the limitation of non-oil exports, clearly indicating that the country needs to use the resources collected from oil to boost the manufacturing industry, especially for those products that are part of the Angolan food diet, in order to reduce exchange rate pressure for goods whose comparative advantage is greater than 1.



Graph 3. Export Volume (in millions of US$) of the Oil Sector and Non-oil Sector and Concentration Index of Exported Products (1990-2022).

Source: Vica (2025).

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Although Angola has a window of opportunity in international trade, the exported products are still of low and moderate economic complexity, occupying 116th place out of the 133 most complex countries. This indicates that the level of "knowledge" produced is still below the world knowledge frontier. Thus, according to Hausmann and Hidalgo (2009), it makes GDP per capita growth more difficult through the expansion of exports of sophisticated products, unlike countries such as China, South Korea, Singapore and Taiwan, which managed to intensify investments directed at human capital, and after half a century dominate the world market in the most diverse less ubiquitous products. Angola, given this limitation, exports ubiquitous products (Fig. 1 and Table 1).

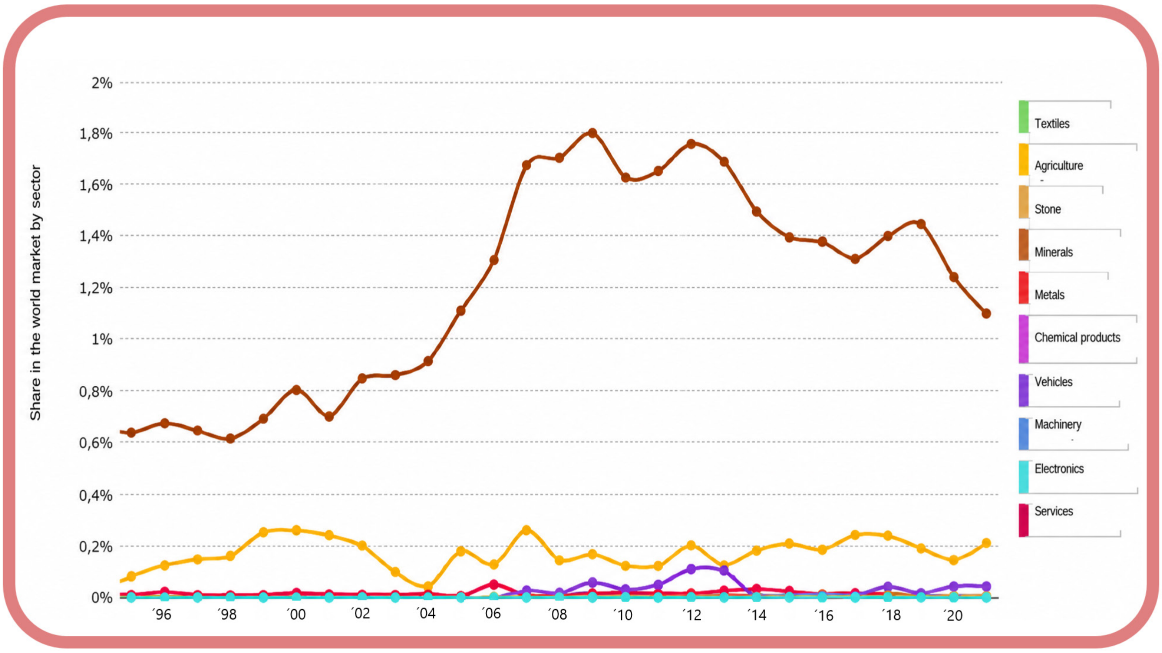

Figure 1. Percentage share (%) of products exported by Angola in the world market
Source: Vica (2025).

Table 1.
Products Exported by Angola with Revealed Comparative Advantage (RCA> 1 and RCA- S<1) (2021)

PRODUCTS	SECTOR	ANGOLAN TRADE	WORLD TRADE	RCA	RCA-S
Petroleum oils (crude)	Minerals	$27.1B	$938B	18,3	0,896
Bituminous mixtures	Minerals	$194M	$6.22B	18	0,895
Granite	Minerals	$46.1M	$2.11B	12,6	0,853
Diamonds	Stone	$2.19B	$114B	11,6	0,841
Alloy and non-alloy steel	Metals	$5.51M	$562M	5,64	0,699
Petroleum gases	Minerals	$2.95B	$418B	4,1	0,608
Cereal residues	Agriculture	$17.4M	$282B	3,6	0,565
Gypsum	Minerals	$4.47M	$1.59B	1,64	0,242
High-temperature coal tar oils etc.	Minerals	$74.1M	$33.3B	1,29	0,127

Source: Vica (2025).

The revenues obtained from these products, crude oil, gas and diamonds, must be exploited as catalysts of the economy, in the sense of dynamising other emerging sectors. Because although they present a revealed competitive advantage greater than 1, they do not allow the country to present a stable growth of fiscal revenues, and thereby compromise public investment.

Angola presents typical behaviour of a highly commodity-concentrated economy; this means that the Angolan economy dances to the rhythm of international oil markets. State revenue rises when oil is high, but collapses at the slightest sign of external decline. The recovery of GDP in 2021 is not explained by internal structural transformation, but rather by a new temporary relief in oil prices. The risk is imminent: growing without diversifying is a way of trying to survive between crises, yet it does not eliminate or reduce them.

The advance of the exchange rate destroys purchasing power, makes external debt more expensive and generates structural inflation. Exchange rate fragility is the visible symptom of an economy trapped in export monoculture.

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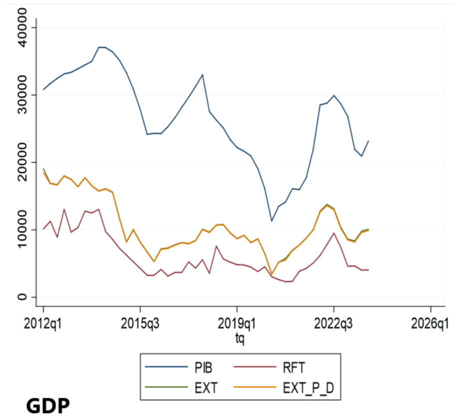
Public spending (pubs) has shown sharp declines since 2015; this presupposes, at first glance, a worsening of the economy, a behaviour contrary to Keynes's principle of effective demand, since a significant fall in Foreign Direct Investment is observed, a large part of investments made by the private sector. In a country that needs to build its future, more is spent to maintain the machinery than to transform reality. The generalised cut since 2015 imposed containment, but not fiscal intelligence. This presupposes the structure of a State that pays to function, but does not invest to grow.

However, it is possible to observe that, since the first quarter of 2012, the Angolan Executive has prioritised the increase of expenditure on salaries and pensions. However, this increase has not necessarily translated into salary adjustments, but rather into the expansion of the number of jobs or, under a more pessimistic reading, into the duplication of ineffectiveness and the reinforcement of the administrative structure.

Given the current context of fiscal constraint, the Executive must adopt a more parsimonious stance, aligned with prudent fiscal policy, without, however, asphyxiating economic activity. Austerity, to be effective, must be selective. Thus, it becomes imperative to prioritise public spending with greater potential to stimulate economic growth, capable of generating more jobs, dynamising domestic production and expanding the fiscal base in a sustainable manner.

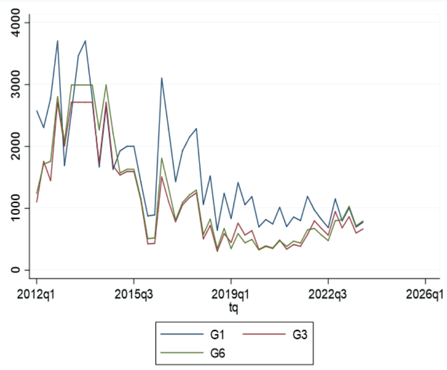
The question that will not be silenced: Is all public spending in Angola able to withstand a social cost-benefit analysis? Or do we maintain expensive and ineffective structures, whilst medicines are lacking in hospitals and books in schools? The crucial question is: which spending serves the people and which serves the bureaucracy?

4 . GDP (in millions of US$)



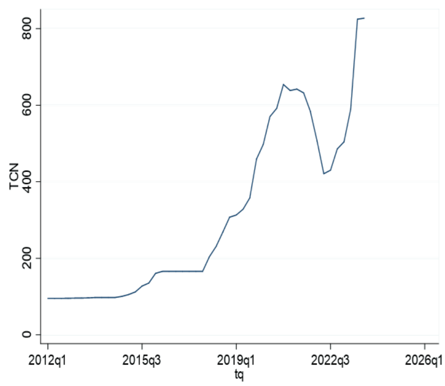
GDP
TTR (Total Tax Revenue
TE (Total Exports)
ODE (Oil and Diamond Exports)

5. Gpub (in millions of US$)



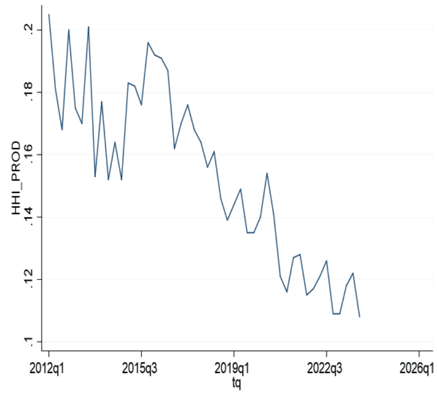
Gpub1(Spending on wages and pensions);
Gpub3 (Spending on Goods and Services
Gpub6 (Public Investments)

6. Exchange Rate (kz/US$)



Source: Own elaboration. Data from Minfin.

7. Diversification Index



Source: Own elaboration. Data from Minfin.

Graph 4 – 7. GDP (in million US $) / Gpub (in million US $) / Exchange Rate (kz/US$) / Diversification Index

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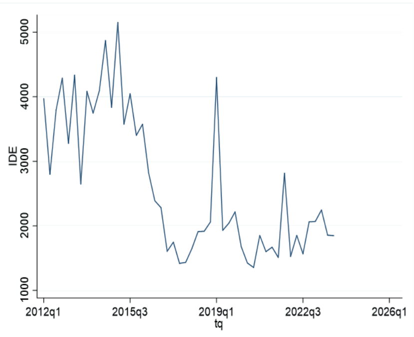
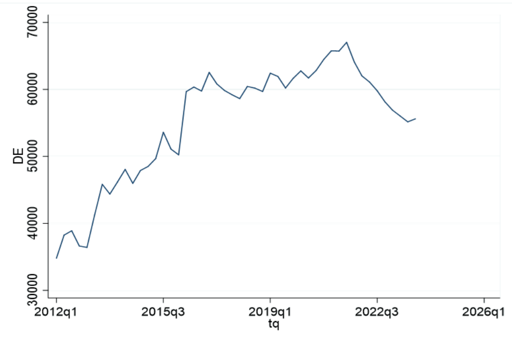
The apparent sustainability of Angola's public debt may hide deep structural fragilities. An economy excessively dependent on a concentrated and regressive productive sector is constantly at the mercy of external shocks. Relying on this structure is like building a sandcastle by the sea: it only takes a storm – in international markets – for fiscal balance and economic stability to collapse with rapid and devastating force.

8. FDI (in millions of US$)



Source: Own elaboration. Data from Minfin.

9. External Debt (in millions of US$)



Source: Own elaboration. Data from Minfin.

Graph 8 and 9. PIDE (million USD) / External Debt (million USD)

Thus, we propose in the section below an empirical study to identify which economic indicators most impact the growth of Angolan GDP.

Methodology / Material And Methods

This section presents the empirical strategy adopted to identify the main factors influencing the dynamics of Gross Domestic Product (GDP) growth in Angola. The selection of variables used in the model is based both on theoretical foundations from the macroeconomic literature and on the structural characteristics of the Angolan economy.

Starting from the approach proposed by Anthony Thirlwall (1979), according to which the economic growth of open economies can be conditioned by the dynamics of exports and external constraints, the following simplified relationship between output growth, exchange rate and exports is initially considered:

$$g_{y_t} = g_{cambio_t} + g_{x_t} \tag{2}$$

where g represents the growth rate (Δ in %), Ycorresponds to GDP and X to exports.

The output growth rate can be expressed as the logarithmic change in GDP between two consecutive periods:

$$g_{y_t} = lnY_t - lnY_{t-1} \tag{3}$$

which allows rewriting the dynamics of output as:

$$lnY_t = lnY_{t-1} + g_{cambio_t} + g_{x_t} \tag{4}$$

However, considering the particularities of the Angolan economy – characterised by a strong dependence on natural resources, a high concentration of exports in the oil sector and significant State participation in economic activity (Vica, 2025) – it is necessary to adapt the theoretical model to reflect these specificities.

In this sense, in line with the effective demand approach of John Maynard Keynes (1936), it is assumed that the output level is strongly influenced by the dynamics of aggregate demand, in which public spending plays a relevant role. Thus, it is assumed that tax revenue T can be repre-sented as a proportion of output observed in the previous period:

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$$T_{t-1} = \tau_t Y_{t-1} => \tau_t = \frac{T_{t-1}}{Y_{t-1}} \quad (5)$$

Where T represents tax revenue and τ corresponds to the average collection rate.

Additionally, considering that, in natural resource-dependent economies like Angola, a large part of public revenue is associated with oil exports [Rodrik (2016), Vica (2025)], it is assumed that:

$$G_{t-1} = T_{t-1} \quad (6)$$

and that exports can be approximated by the dynamics of the international oil price:

$$X_{t-1} \approx precoil_{t-1} \quad (7)$$

Thus, incorporating these structural characteristics of the Angolan economy, the output equation can be rewritten as:

$$lnY_t = lnG_{t-1} + g_{cambio_t} + g_{precoil_t} \quad (8)$$

This specification allows capturing three fundamental channels of influence on economic growth in Angola:

i. public spending, which reflects the role of the public sector in determining aggregate demand;
ii. the exchange rate, which influences the external competitiveness of the economy;
iii. the international oil price, a crucial variable given the country's high dependence on oil exports.

Based on this theoretical structure, these variables were selected to compose the econometric model estimated in this study.

To this end, we will use the empirical analysis methodology with the VAR (Vector Autoregressive) model to evaluate the interactions between the explained variables. Thus, in this topic, we intend to achieve the following specific objectives:

iv. To identify causality between tax revenues, public spending, and economic growth.
v. To assess the impact of the oil price on tax revenue.

The VAR method proves especially suitable for analyses involving multiple economic variables that influence each other over time, without the need for prior distinction between dependent and independent variables. By treating all variables as endogenous, VAR differs from other methods that require the explicit definition of causal relationships. However, this does not invalidate the formulation of equation (8), which plays a fundamental theoretical role in structuring the determinants of economic growth. Thus, the VAR model helps reduce the risk of specification errors, allowing interdependencies between variables to emerge directly from the data. For this specific research, the VAR can help understand: (1) how oil price shocks affect tax revenues and the exchange rate; (2) the dynamics between public expenditure, exchange rate and economic growth. The data were transformed to natural logarithms, having as base unit millions of US dollars, and are on a time horizon from 2012q1 to 2023q4. The data source, as per the table below, was extracted from the database of the Angolan Ministry of Finance and cross-checked with the database of the National Bank of Angola (BNA) by the Department of Statistical Studies (DSS).

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Frame 1.
Description of Variables and Sources

VARIABLES	MEANING	SOURCE
GDP	Gross Domestic Product	Minfin/BNA/DES
Ttr	Total Tax Revenue	Minfin/BNA/DES
Er	Exchange Rate	Minfin/BNA/DES
Oilprice	Oil Price	Minfin/BNA/DES
Pubexp1	Public Spending on wages and pensions	Minfin/BNA/DES
Pubexp3	Public Spending on goods and services	Minfin/BNA/DES
Pubexp6	Public Spending on Investments	Minfin/BNA/DES

Source: Own.

To reduce heteroscedasticity problems and allow the interpretation of coefficients in approximate terms of elasticities, monetary variables were transformed into natural logarithms. Before transformation, the values were expressed in millions of US dollars (USD).

Table 2 presents the descriptive statistics of the variables, focusing on the analysis of means and data dispersion. The sample is balanced and consistent, with 48 observations for all time series. The means range between 4 and 10, reflecting the use of natural logarithms, a transformation that standardises the scale of the variables and facilitates economic interpretation in terms of elasticity. GDP stands out as the most stable variable, presenting the lowest standard deviation (0.28). In contrast, the Exchange Rate (Er) exhibits the highest volatility in the set, with a standard deviation of 0.75. Overall, the low standard deviation values (less than 1) indicate a low dispersion around the mean, which ensures the necessary robustness for subsequent econometric tests.

Table 2.
Descriptive Statistics of Variables

VARIABLES	OBS	MEAN	STD. DEV.	MINIMUM	MAXIMUM
GDP	48	10.14748	0.2866123	9.334529	10.52085
Ttr	48	8.613217	0.4747303	7.745397	9.475425
Er	48	5.462697	0.754084	4.55703	6.718312
Oilprice	48	4.246976	0.3685345	3.303217	4.776599
Pubexp1	48	7.238285	0.5235508	6.469932	8.217398
Pubexp3	48	6.79607	0.6621638	5.726913	7.90616
Pubexp6	48	6.84417	0.6999853	5.797091	8.004235

Source: Own.

Before estimating the econometric model, the stochastic properties of the series were analysed using the Augmented Dickey-Fuller (ADF) unit root test, as per Table 3. The objective of this procedure is to verify the degree of stationarity of the variables and avoid the occurrence of spurious regressions.

Table 3.
Unit Root Test (p < 5%)

VARIABLES	I(0)	I(1)	VARIABLES TRANSFORMED INTO DIFFERENCE (D)	I(0)	I(1)
Ln_GDP		0.6275	D_Ln_GDP	✓	0.0002
Ln_Ttr		0.2816	D_Ln_Ttr	✓	0.0000
Ln_Er		0.9824	D_Ln_Er	✓	0.0008
Ln_Oilprice		0.2849	D_Ln_Oilprice	✓	0.0000
Ln_ Pubexp1	0.0411			✓	0.0000
Ln_ Pubexp3		0.1776	D_Ln_Pubexp3	✓	0.0000
Ln_ Pubexp6		0.2789	D_Ln_Pubexp6	✓	0.0000

Source: Own elaboration.
Note: Hypotheses H_(0):has unit root;H_(1):does not have unit root.

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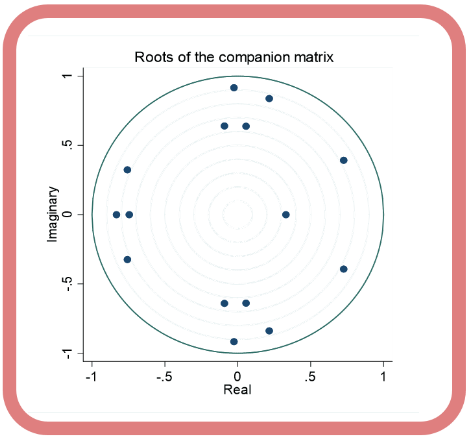
The results of the Augmented Dickey-Fuller (ADF) unit root test indicate that most variables are non-stationary in level, since the null hypothesis of a unit root is not rejected (with the exception of Ln_Pubexp1). However, when applying the first difference, all series became stationary, presenting a p-value significantly lower than 0.05. Therefore, the variables are classified as integrated of order one, I(1), with no series identified that required second-order differencing I(2).

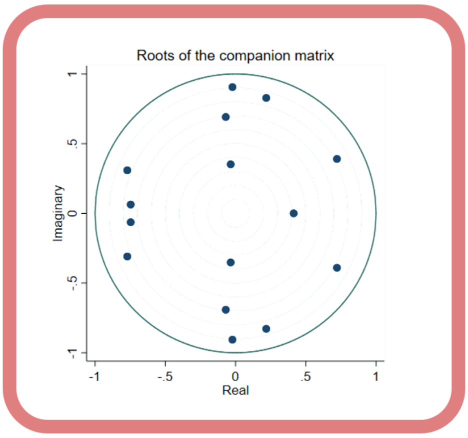
Consequently, tests follow after statistical inference. The stability test serves to ensure that the model will not fail or produce erroneous results over time. When the model passes this phase, it demonstrates that the data can assist in forecasting the economy without concern for possible estimation errors.

Stability Test of Model (A)



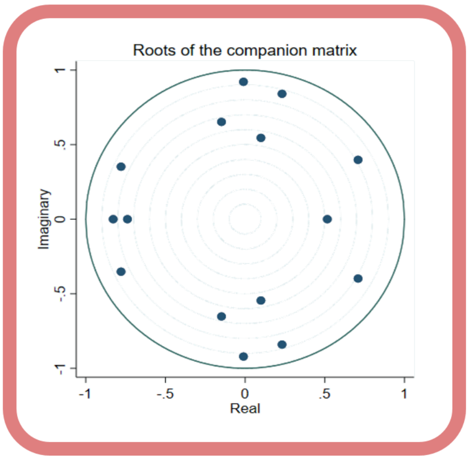
Source: Own elaboration. Stata 15.1

Stability Test of Model (B)



Source: Own elaboration. Stata 15.1

Stability Test of Model (C)



Source: Own elaboration. Stata 15.1

Graph 10. Stability Tests of the Proposed Models

The three analysed models are completely stable. All black points lie within the circle in the graphs. This proves that the mathematical model has no flaws. Therefore, the analysed data are safe and very reliable.

Results and Discussion

The estimated VAR model allows analysing the dynamic interactions between shocks in the oil price, exchange rate, public spending, tax revenue and GDP growth. In line with the literature on natural resource-dependent economies, as highlighted by Jeffrey Sachs and Andrew Warner in their 1995 work entitled: Natural Resource Abundance and Economic Growth, the Angolan produc-tive structure strongly conditions the transmission channels of fiscal policy, making the composition of public expenditure a central factor for dynamics of growth.

The estimated VAR model with lags (as identified by information criteria) allows analysing the dynamic interactions between oil price shocks, exchange rate variations, public spending, total tax revenue and GDP growth. In the Angolan context, characterised by strong dependence on oil revenues, the composition of public spending can assume a central role in the dynamics of aggregate demand. In this context, the main objective is to verify how public spending influences economic growth in a context of high external dependence and commodity price volatility.

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Thus, the other variables in the model were kept constant, only alternating the types of public spending, represented by pubexp1, pubexp3 and pubexp6, in order to compare their relative effects on fiscal and macroeconomic variables. Thus, we will have three models to be estimated:

$$lnpib_t = ln\_pib_{t-1} + ln\_gpub1_{t-1} + \ln\_tcn_{t-1} + \ln\_precoil_{t-1} + \ln\_rft_{t-1} \quad \text{(A)}$$

$$lnpib_t = ln\_pib_{t-1} + ln\_gpub3_{t-1} + \ln\_tcn_{t-1} + \ln\_precoil_{t-1} + \ln\_rft_{t-1} \quad \text{(B)}$$

$$lnpib_t = ln\_PIB_{t-1} + ln\_gpub6_{t-1} + \ln\_tcn_{t-1} + \ln\_precoil_{t-1} + \ln\_rft_{t-1} \quad \text{(C)}$$

Table 4.
Statistical Inference of Equations (A, B and C) for a Set of Variables

DESCRIPTION	MODEL A		MODEL B		MODEL C	
Ln_gdp	Lags (3)	-0.7357*** (0.000)	Lags (2)	-0.4561** (0.043)	Lags (2)	-0.4471** (0.047)
Ln_pubexp	Lags (1)	0.0780** (0.029)	Lags(2)	-0.0686 (0.081)	Lags (1)	0.0818** (0.028)
Ln_er	Lags (2)	-0.7443*** (0.002)	Lags 2)	-0.8378*** (0.001)	Lags (2)	-0.7500*** (0.002)
Ln_oilprice	Lags (1)	0.3543*** (0.000)	Lags (1)	0.3718*** (0.000)	Lags (3)	0.3489*** (0.001)
Ln_ttr		s/sg		s/sg		s/sg
R^2	56%*** (0.000)		56%*** (0.000)		55%*** (0.000)	
Obs.	44		44		44	
Log likelihood	182.4302		182.5388		187.2875	
AIC	-4.65592		-4.66086		-4.87670	
FPE	7.79e-09		7.75e-09		6.24e-09	
Det –Sigma_ml	1.72e-10		1.71e-10		1.38e-10	
JB (p < 5%)	0.31761		0.02121		0.79180	

Source: Own from STATA 15.1.
Note: Log likelihood (the logarithm of the likelihood measures how well the model fits the data: the higher, the better); AIC (Akaike Information Criterion – more sensitive, favours models with more parameters, the lower (more negative) the better); FPE (Final Prediction Error – measures the model's forecasting ability, the lower the better). Det (Sigma_ml – indicates the quality of fit and degree of correlation among residuals, values close to zero are desirable). **, *** statistical significance at the 5% and 1% levels; s/sg (with-out statistical significance).

Validity of tests:

i. The models are statistically robust, with an explanatory power R^2 between 55-56% and well-behaved residuals, except for Model B, where the normality test indicates a violation of residuals; however, this does not compromise economic analysis due to robust infer-ence to non-normality.
ii. The models are stable, that is, they show no signs of breaks that could compromise the analyses.
iii. The public investment model is the best statistically specified (lowest AIC, FPE and de-terminant of residual variance).

Economic validity:

i. The negative and significant coefficient for GDP in all three models confirms that past GDP growth is followed by slowdowns, indicating unstable economic cycles or mean-reversion effects. This reflects the vulnerability of the Angolan economy to external shocks and the discontinuity of sustained growth policies.
ii. Public spending on wages and pensions (Model A) shows a positive and significant coef-ficient (0.0780, $p < 0.05$); that is, job creation in the public sector has a positive effect on GDP, possibly reflecting a stimulus to aggregate demand via household consumption. However, the impact is relatively modest.
iii. Model B (goods and services) presents a negative, non-significant coefficient ($p = 0.081$), suggesting that this type of spending has no relevant effect on GDP – and possibly repre-sents operating expenses with low economic return.

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iv. Meanwhile, public investment (Model C) shows a positive and significant coefficient (0.0818, $p < 0.05$), the largest and most robust among the three models, confirming that building construction, infrastructure and facilities, means and equipment of transport, and property acquisition are the types of spending that most boost economic growth.
v. The exchange rate, with a negative and highly significant coefficient in all models ($p < 0.01$). This shows that the depreciation of Kwanza (AKZ/USD) has a negative effect on GDP – reflecting an increase in the cost of imports and inflationary pressure.
vi. The oil price variable shows a positive and significant coefficient in all models ($p < 0.01$). This suggests that a rise in the oil price stimulates GDP, confirming the structural de-pendence on the external sector.
vii. Last but not least, tax revenue, with no statistical significance (s/sg). This suggests that revenue alone does not directly affect GDP, reinforcing our thesis that its impact depends on how the collected resources are spent.

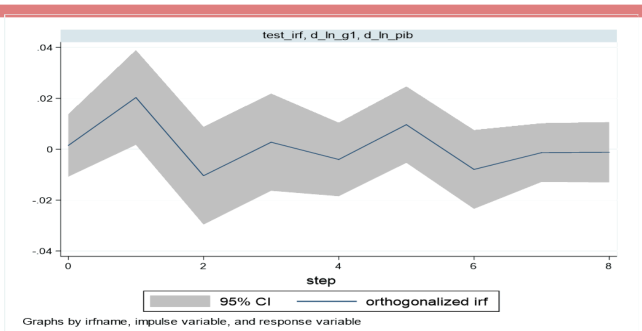
From the impulse-response analysis (OIRF) and forecast error variance decomposition (FEVD), it was found, in all three estimated models, that GDP growth constitutes the main determinant of tax revenues in Angola (Graphs 11, 12 and 13).

The shocks (impulse-response) in public spending change GDP in different ways. Salary payments (pubexp1) cause GDP to grow quickly. The purchase of goods and services (pubexp3) causes a drop before recovering. Direct investment (pubexp6) makes the economy fluctuate considerably. In the end, all spending leaves GDP at a positive level.

At the beginning, GDP explains almost all of its variation alone (error decomposition). The strength of government spending appears over time. As months pass, public expenditure gains more importance. This test confirms that spending leaves long-lasting effects on the economy. It continues to affect GDP for many future periods.

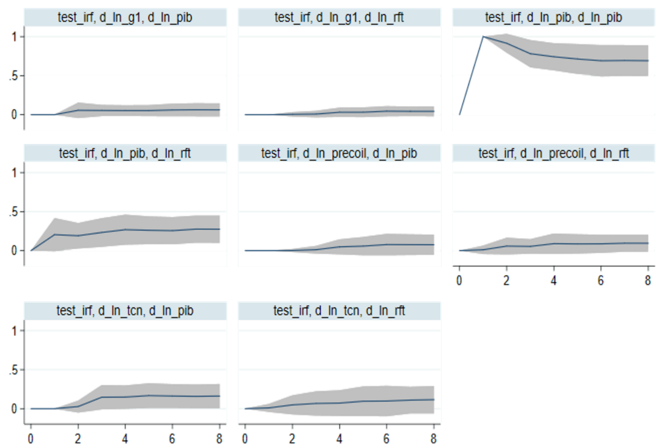
Model A is stable and completely reliable. The shock to wages generates rapid and positive growth in GDP in the first few months. Over time, this reaction undergoes small oscillations but remains firmly in the positive field. The variance decomposition shows that GDP responds well to this type of spending, with effects lasting for long periods in the economy.duram por longos períodos na economia.

Impulse of pubexp1 on GDP – OIRF



Source: Own elaboration. Stata 15.1.

Forecast Error Variance Decomposition – interaction between variables – FEVD

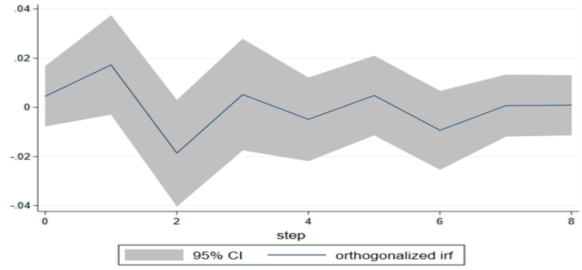


Source: Own elaboration. Stata 15.1.

Graph 11. Impulse Response and Forecast Error Variance Decomposition – Model A

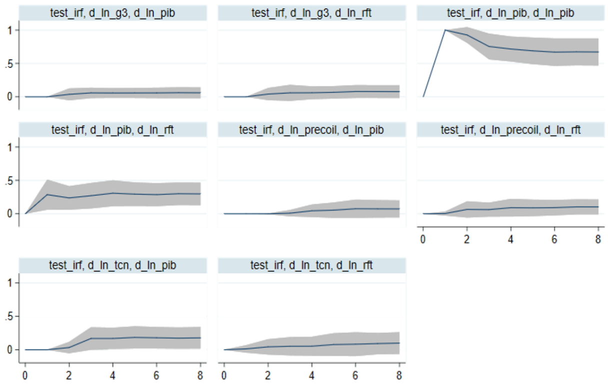
Model B also passed the test. When the government spends on goods and services, GDP starts high but suffers a sharp drop soon after. After this initial scare, the economy manages to recover and stabilise. This behaviour shows that the impact of this spending oscillates considerably before delivering a constant return.

Impulse of pubexp3 on GDP – OIRF



Source: Own elaboration. Stata 15.1

Forecast Error Variance Decomposition – interaction between variables – FEVD

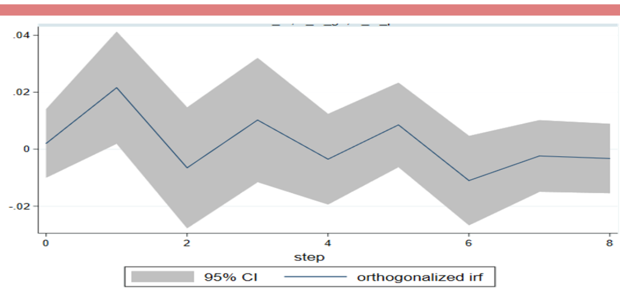


Source: Own elaboration. Stata 15.1

Graph 12. Impulse Response and Forecast Error Variance Decomposition – Model B

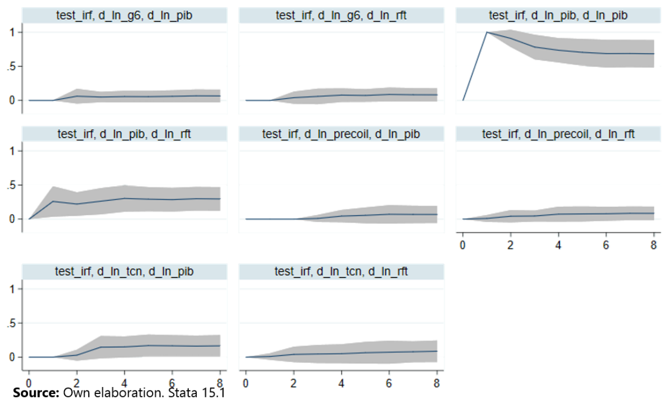
Finally, Model C shows guaranteed stability for projections. The impact of direct investments makes GDP fluctuate intensely, rising and falling several times over time. In the variance decomposition, it is clear that the strength of this spending takes a little longer to appear, but leaves a deep and lasting mark on the country's growth.

Impulse of pubexp6 on GDP – OIRF



Source: Own elaboration. Stata 15.1

Forecast Error Variance Decomposition – interaction between variables – FEVD



Source: Own elaboration. Stata 15.1

Graph 13. Impulse Response and Forecast Error Variance Decomposition – Model

This empirical evidence reinforces the need for the Executive to accelerate the economic diversification agenda, given that the increase in revenues is strongly associated with the expansion of the tax base. In practical terms, the results indicate that a broader and more diversified productive structure enables the growth of tax collection without resorting to higher tax rates. Thus, economic policy should prioritise non-oil sectors with high added value potential, in order to ensure a more stable fiscal trajectory, less dependent on external volatility, and financially sustainable in the medium and long term.

The empirical results, Table 4, indicate that the impact of public expenditure on economic growth varies significantly depending on its composition, corroborating international evidence that not all types of spending have the same multiplier effect. In particular, public investment (Model C) presents the largest positive and statistically significant impact on GDP, a result consistent with studies by Ethan Ilzetzki, Enrique Mendoza and the International Monetary Fund (2011; 2013), which demonstrate that capital spending tends to generate larger multipliers, especially in developing economies with structural constraints.

On the other hand, spending on wages and pensions (Model A) shows a positive but smaller effect, reflecting an impact predominantly associated with stimulating aggregate demand through consumption, in line with the Keynesian approach of John Maynard Keynes (1936). This result is also consistent with the empirical evidence that current expenditure has more transitory effects and less capacity to expand long-term productivity.

In contrast, spending on goods and services (Model B) proves statistically non-significant, suggesting low economic efficiency. This finding finds support in the literature that points to the poor quality of public spending in natural resource-dependent economies, where operational expenses tend to have a low economic return, as discussed by Dani Rodrik in his work The Premature Industrialization published in 2016.

Regarding the exchange rate, the negative and highly significant coefficient in all models indi-cates that exchange rate depreciation has adverse effects on economic growth, reflecting the high degree of dependence on imports and inflationary transmission. This result is in line with Rudiger Dornbusch's (1976) exchange rate overshooting model, according to which open econ-omies vulnerable to external shocks can experience contractionary effects in the short term resulting from exchange rate devaluations.

Additionally, the international oil price has a positive and statistically significant impact on GDP in all models, confirming the dominant role of this resource in the Angolan economy. This result reinforces the evidence from the literature on the "resource curse", widely discussed by Sachs and Warner, according to which economies highly dependent on commodities tend to exhibit strong sensitivity to external shocks.

Furthermore, the lack of statistical significance of tax revenue suggests that economic growth is not directly driven by the volume of collection, but rather by how resources are allocated. This result aligns with the recent literature on fiscal policy quality, which emphasises spending effi-ciency over its total volume, as highlighted by the International Monetary Fund (2011).

The impulse-response analysis (IRF) and forecast error variance decomposition (FEVD) further reveal that GDP growth constitutes the main determinant of tax revenues, evidence consistent with the hypothesis of fiscal endogeneity discussed in the macroeconomic literature. This result reinforces the need for policies aimed at economic diversification, since the expansion of the productive base emerges as an essential condition for long-term fiscal sustainability, as argued by Dani Rodrik (2013).

Conclusions

- Structural change must be capable of providing an improvement in the social component of the Angolan population in the long term, reversing concentrated economic growth and vulnerability to external shocks.
- The results obtained from the three estimated models, each representing a distinct category of public spending (wages, goods and services, and public investment), reveal an uncomfortable yet undeniable truth: Angola continues to depend excessively on its economic cycle to generate tax revenues. Regardless of the nature of spending, it is GDP growth that most explains the be-haviour of tax collection, while control variables such as the nominal exchange rate and oil price maintain significant influence, reflecting the persistent external vulnerability of the economy.
- Even more troubling is the finding that spending on wages (Model A) and on public investments (Model C) have a statistically significant impact on growth, whereas spending on goods and ser-vices (Model B) does not demonstrate the same efficacy – which raises questions about the al-locative efficiency of public expenditure.
- These findings should therefore challenge the Angolan Executive to rethink the quality of public spending. In summary, the study issues a provocation: as long as the economy remains concen-trated and vulnerable to external shocks, any fiscal policy will be structurally limited. The true path to strengthening public finances in Angola is not to increase taxes, but to expand economic opportunities. And despite tax revenue in the three models not showing statistical significance, its relevance in the literature on economic development remains valid, since tax revenue contin-ues to be a determinant for the sustainability of future public spending. Therefore, I encourage further research on the interaction between tax revenues and public spending.

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